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THE EFFECT OF INFORMATION, EXPOSURE AND ASSOCIATIONS ON LIKING FOR NOVEL FOODS AMONG SUBJECTS WITH VARYING NEOPHOBIA

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ABSTRACT

The purpose of the study was to determine if people who differ in food neophobia (reluctance to eat novel foods) respond differently to sensory and verbal information concerning familiar and novel foods. In addition, this study investigated the role of uncertainty about product identity and associations with familiar foods as possible mediating mechanisms affecting hedonic ratings and behavioral intentions. Subjects completed a 10-item questionnaire measuring the trait of food neophobia and were divided into three subgroups equal in the distribution of neophobia, age and gender. All were presented with familiar and novel foods or beverages (Finnish Easter pudding, root beer and Finnish nonalcoholic beer). One group received no information, the second group was informed of the names of the products, and the third group was provided with descriptions of ingredients and use. Subjects rated the samples under three conditions: 1) based on appearance only, 2) based on appearance and smell, and 3) based on appearance, smell and taste. During each condition, they rated their expected liking (or in Condition 3, their actual liking), their degree of certainty of the expected taste and of the identity of the product. They also reported which specific foods or beverages they associated with their samples and rated their liking for the associated products. The results and their implications are discussed.

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INTRODUCTION

Humans, like other animals, have an inherent tendency to avoid new foods (Rozin & Vollmecke 1986, Zellner 1991, Pliner & Hobden 1992). Although this tendency, called neophobia, may protect people from eating risky foods, it is also restrictive. It acts as a barrier against enjoying new taste experiences and using new sources of energy and nutrients in situations in which flexibility would be beneficial or even critical for survival. From the food manufacturer's point of view, introducing a novel food in the marketplace involves a risk, since the sensory or cognitive effects or other food associations may prevent its success, even though the same food may be perfectly acceptable in other food cultures. To reduce this risk of failure, we need to understand mechanisms and factors that may contribute to the acceptance of novel foods.

Past research on novel foods has focused on the idea that exposing a subject to a novel food through tasting will increase that subject's willingness to try it again (Pliner, 1982, Pliner et al., 1993); and a few studies have examined the effect of cognitive information about a novel food on acceptability and behavioral intent (Seaton & Gardner, 1959; Wolfson & Oshinsky, 1966). Although both exposure and cognitive information have been shown to decrease neophobic tendencies in some cases, it is not known by what mechanisms this change occurs. Cardello and co-workers (1985, 1992) have suggested that the expected liking for a product prior to tasting affects actual liking for the product, based upon the level of hedonic disconfirmation that the taste experience produces. It could be reasoned that through exposure to a novel product or via information about it, expectations are altered, resulting in a change in hedonic rating for the food.

It is possible that the neophobic response to novel food is based upon a subject's lack of certainty about the product's hedonic value, identity, or sensory properties. Uncertainty has been extensively researched in nonfood areas (Eckblad, 1963; Heyduk & Bahrick, 1977), but has never been applied to food research. This uncertainty about a food may produce an anxiety toward the food, resulting in neophobic behavior. Exposure to information or to the actual product may function to decrease uncertainty about the product, thereby reducing a subject's level of anxiety toward the novel food, resulting in a more favorable rating.

Still another possible mechanism mediating a change in neophobia is that of association. The visual, olfactory and/or taste properties of a novel food may remind a subject of a more familiar food. If so, the level of appeal of the associated food may mediate the level of expected liking for the novel food.

The present study sought to combine a number of the factors which might contribute to overcoming neophobia. Subjects differing in neophobia (higher vs lower) were presented with one of three different information conditions (no information, name

information, descriptive label information). In addition, sensory information was investigated within subjects. Effect of repeated exposure was examined after eight weeks. Measures of expected liking and actual liking, product certainty, and food associations and liking were obtained.

METHODS

SUBJECTS

Subjects were drawn from a pool of 201 Natick employees who completed a 10-item questionnaire on food neophobia (FNS) (Pliner & Hobden, 1992). The questionnaire contained items such as "I don't trust new foods" and "I like to try new ethnic restaurants." Subjects rated each statement on a 7-point scale from "strongly disagree" to "strongly agree" and, after reversal of ratings given to "positive" items (such as the latter statement), individual summated scores (range 10-70), reflecting a subject's neophobia level, were computed. Three treatment groups of 45 subjects each were balanced for number of "neophilic" (FNS scores 10-22; mean 17) and "neophobic" (FNS scores 30-54; mean 38) individuals, for age, and for gender. Of these 135 subjects, fourteen were unavailable at the time of the final sensory tests, leaving a final population of 121 subjects.

STIMULI

Finnish and American products were used as stimuli. The Finnish products were Easter pudding and nonalcoholic beer. The American product was root beer and was chosen because the carbonation and color resembled that of the nonalcoholic beer. The Easter pudding was presented at room temperature on a white dish (sample size = 15 g). The nonalcoholic beer and root beer were presented at 5°C in transparent 140 mL glasses (sample size = 40 mL).

PROCEDURES

Verbal information was used as a between-groups variable and sensory information as a within-groups variable. One of the three test groups was given no verbal information about the samples (Condition 1). The second group was informed of the names of the products ("Finnish pudding," "Finnish nonalcoholic beer," "root beer") (Condition 2). The third group (Condition 3) received descriptions of ingredients and use contexts but not names.

All subjects rated the samples sequentially in three phases: 1) based on appearance, 2) based on appearance and smell, and 3) based on appearance, smell and taste. Each sample and condition was accompanied by a test form. In verbal information conditions 1 (no information) and 3 (descriptive information), the subjects rated expected liking (dislike extremely - like

extremely) during visual and smell trials and actual liking during taste trials. Subsequently, subjects rated their certainty of the product's identity (extremely uncertain - extremely certain). They then responded to an open-ended question on what food or beverage most closely resembled the test sample, how much the test sample resembled the associated product (vaguely - extremely) and how much they liked/disliked the associated product (dislike extremely - like extremely). All ratings were made on 9-point scales with only the end points verbally anchored.

In condition 2 (label information), the question on product certainty and the questions related to associations were eliminated, since the label indicated the identity of the sample.

Eighty subjects participated in a follow-up study approximately eight weeks after participating in the main study. Subjects were given the same verbal information they received eight weeks earlier, but the only sensory condition was tasting. They rated their liking of each sample and the likelihood of consuming it in the future.

RESULTS AND DISCUSSION

The data were analyzed in terms of the important independent variables investigated, as discussed below. Details of the results have been reported elsewhere (Tuorila et al., 1994).

LABEL AND INFORMATION

The results of the three different information conditions were as follows: Verbal information increased liking (Fig. 1). In general, for novel foods, the effect of label and descriptive information was similar, but liking for root beer was significantly increased by label information, compared to the other two conditions. Also, liking for novel foods decreased when more sensory information became available, while liking for root beer increased.

In the literature, neophobia has mainly been considered as a biological mechanism (e.g., Rozin & Vollmecke, 1986). Cognitive effects on a neophobic response have not received attention. However, according to earlier studies, a label can greatly enhance the acceptance of novel foods (Seaton & Gardner, 1959; Wolfson & Oshinsky, 1966). A descriptive, specific label may elicit higher acceptance ratings than a general, nonspecific label (Cardello et al., 1985). However, Meiselman & Bell (1993) found that, in some instances, providing an ethnic name for a food lowered hedonic response, since the label elicited low hedonic expectations.

It can be concluded that verbal information enhances the acceptance of novel foods and that this approach for influencing food neophobia can be employed by food manufacturers to help ensure success of a novel product.

FIG. 1

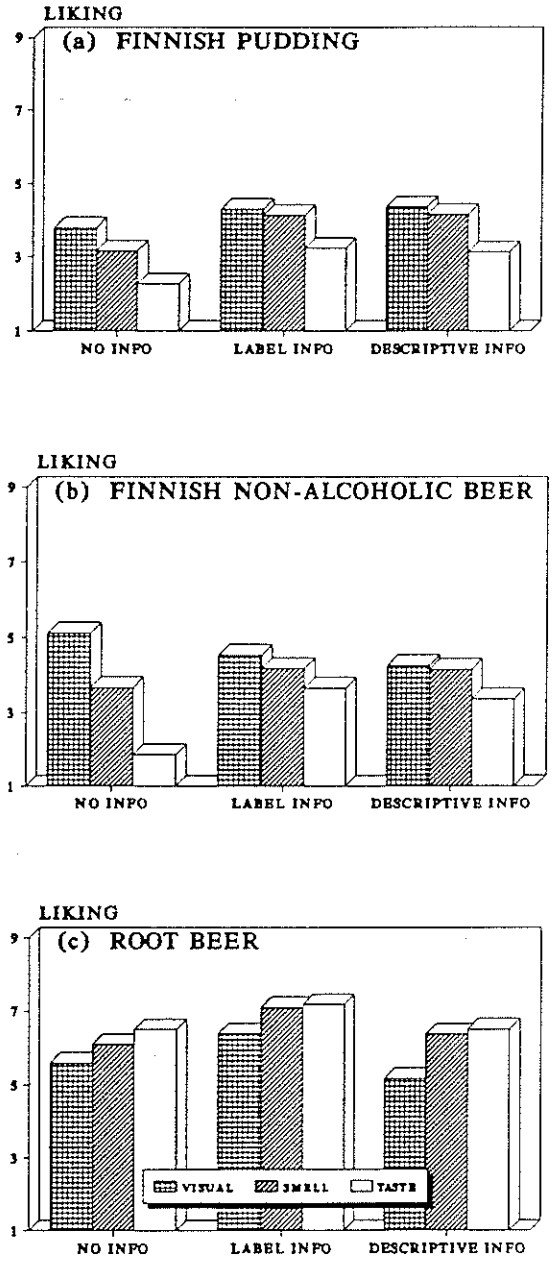

FIGURE 1. Mean expected (visual and smell conditions) and actual liking (taste condition) for experimental samples in the three verbal information conditions (no information = NO, n = 42; label information = LI, n = 40; descriptive information = DI, n = 39).

FIG. 2

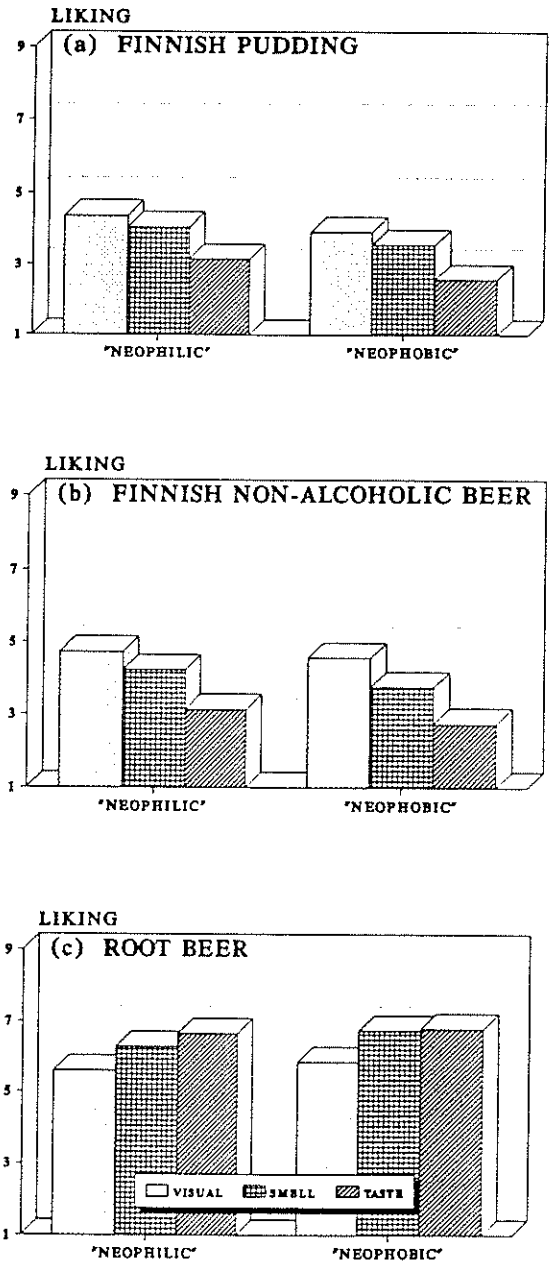

FIGURE 2. Mean expected (visual and smell conditions) and actual liking (taste condition) for experimental samples by neophilic (n = 60) and neophobic (n = 61) subjects

"NEOPHILIC" ATTITUDE

Ratings of expected and actual liking between neophilics and neophobics were significantly different: neophilic subjects were more positive towards the novel foods in all sensory conditions (Fig. 2). Neophobics tended to like root beer better than neophilics, but this effect was not significant. Thus, neophobia, measured with the technique introduced by Pliner and Hobden (1992), appears to be one factor in contributing to unfavorable responses to new foods. However, the effect is not large and more importantly, there is no interaction between neophilia/phobia and sensory condition. Thus, neophilics and neophobics had the same decreasing trend in their reponses to novel products (at least, these particular ones) when the exposure advanced from appearance to taste. However, it may be worthwhile to study the within-subject stability and to what extent neophobia can be manipulated. A lower score on the Neophobia scale appears to be predictive of more favorable responses to novel products.

REPEATED EXPOSURES

Subjects in the follow-up study rated the Finnish nonalcoholic beer significantly more favorably in the second than in the first exposure (Table 1). No significant effects were observed in the case of Finnish pudding or root beer. Neophobics tended to catch up with the neophilics, so that their ratings of novel foods during the second exposure were higher than those of neophilics; but, this effect did not reach statistical significance.

One of the mechanisms that has been shown to increase liking for new foods is mere exposure (Pliner, 1982; Pliner et al., 1993). However, mere exposure may easily involve various conditioning mechanisms, including social, postingestional, or pharmacological (for a review see Zellner, 1991). Repeated exposures (combined with other persuasion procedures) are a major mechanism through which children learn the food preferences of their own cultural group (see Birch & Marlin 1982; Rozin & Vollmecke 1986).

Overall, these data provide some support for an exposure effect, even though the time between the first and second exposure was fairly long. It would be interesting to follow the effect of exposures for an extensive period of time and to learn to what extent they can modify acceptance of novel products.

TABLE 1. RATINGS OF LIKING: SECOND EXPOSURE MINUS FIRST EXPOSURE

Information Condition	Sample	Liking Among "Phil"	"Phob"
No Info (N = 29)	Finnish Pudding	-0.1	+0.2
	Finnish Beer	+0.1	+0.6
	Root Beer	+0.3	+0.5
Label Info (N = 27)	Finnish Pudding	-0.5	+0.2
	Finnish Beer	+0.3	+0.7
	Root Beer	-0.3	0.0
Descriptive Info (N = 24)	Finnish Pudding	-0.1	+0.3
	Finnish Beer	+0.3	+0.9
	Root Beer	-0.2	+0.4

ASSOCIATIONS

Subjects participating in the "no information" and "descriptive information" groups were presented with an open-ended question on which familiar food they would associate with the sample they were testing. They rated on 9-point scales the extent to which the sample resembled the associated product (vaguely - extremely) and how much they liked the associated product. Expected and actual liking for the sample was predicted from these two variables and their interaction. Liking for the associated product alone or the resemblance alone were nonsignificant predictors of liking for the test product, but their interaction predicted a major part of the variation in the ratings of liking (Table 2).

The acceptance of a novel sensory characteristic, e.g., a flavor, can be enhanced by associating it with a familiar and well-liked characteristic (Zellner et al., 1983). Similarly, associating a food with negative postingestional consequences can result in dislike for the food (Pelchat & Rozin, 1982). New products can be associated with familiar ones not only in terms of sensory properties, but also based on functional properties, image, social context, etc. Since associations with familiar foods can operate at various levels, they are probably a useful tool when novel foods are introduced to potential consumers.

Based on these data, it seems that the mechanism for a novel food becoming acceptable is resemblance to a familiar product that is well liked by the individual.

TABLE 2. PREDICTION OF LIKING FROM ASSOCIATIONS

Sample	Regression Coefficient			R^2
	Like	Resemblance	Like x Resemblance	
Finnish Pudding	-	-	0.72 ***	0.54
Finnish Beer	-	-	0.72 ***	0.53
Root Beer	-	-	0.94 ***	0.58

*** $p < 0.001$

Each equation is based on 210-243 responses (two verbal info groups, three sensory conditions).

UNCERTAINTY

Reduction of uncertainty about a product's identity was accompanied by an increase in liking. For familiar food, this relationship was linear. For novel foods, the relationship was curvilinear, suggesting there may be a ceiling for how effective reducing uncertainty can be for increasing liking.

Neophobics demonstrated a stronger ceiling effect: after reaching a level of certainty, they did not rate liking higher. Neophilics tended to enjoy the novel food more when uncertainty was reduced.

SUMMARY AND CONCLUSIONS

Neophilics rated novel foods more favorably than did neophobics. Sensory information decreased liking for novel foods but increased liking for familiar foods. Verbal information generally increased liking for all samples. Liking and certainty of product identity were curvilinearly related for novel foods, but linearly related for the familiar food. Liking for products judged to closely resemble the test product predicted up to 64% of the variability in expected and actual liking. Eight weeks later, subjects rated one of the two novel foods higher than in the first exposure, but no other exposure effects were observed. Our data suggest that information (possibly via reduced uncertainty), associations, and exposure contribute to reducing initially negative responses to novel foods; furthermore, neophobia decreases liking for novel foods similarly at all levels of sensory input (visual, smell, and taste).

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